

Session: Ice sheet mass budget  
Oral presentation

## **Grounding line migration of West Antarctic glaciers, detected by ERS radar interferometry**

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ERS radar **interferometry** is a powerful new technique to map the grounding line of outlet glaciers, or more precisely to locate the limit of tidal flexing of their floating sections, or hinge line. Unlike other techniques, radar interferometry can locate the hinge line simultaneously across the entire glacier width, with a precision of a few tens of meters, independent of weather conditions and the presence of surface features. To map the hinge line successfully, multiple **interferograms** with short baselines are necessary to, respectively, eliminate the effect of the long-term velocity of the ice and to minimize the contamination of the **interferometric** signal by the glacier topography. A coarse digital elevation model of the ice sheet is used to remove residual topography-induced fringes. This technique was applied on the major outlet glaciers controlling the ice discharge into the ocean from West Antarctica along **Ellsworth** Land. These glaciers are Rutford ice stream, **Carlsson** Inlet, Evans ice stream and Pine Island glacier. Using ERS data from 1992 and 1996, we mapped the grounding line of these glaciers systematically and more precisely than ever before. In addition, we measured the rate of retreat/advance of the grounding line in the 4 years time difference separating the different acquisitions. To interpret the results, proper consideration needs to be given to the characteristics of the radar data used to map the hinge line (spatial baseline, temporal baseline, radar imaging geometry), the precision of mapping of the hinge line, differences in tidal amplitude, and seasonal effects. Half of the data required for the study have already been successfully processed. A full discussion of the results will be presented at the conference, with obvious significant implications for the current status of **retreat/advance** of West Antarctica.